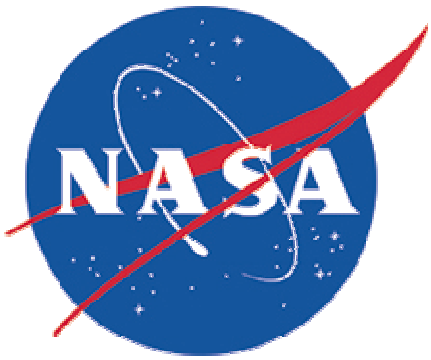

NASA Space Shuttle Workforce Transition Strategy

pursuant to

FY 2008 Consolidated Appropriations Act (P.L. 110-161)

July 2009 Update

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1.0 Introduction

This is the Third Edition of the *NASA Workforce Transition Strategy*. This report responds to direction in the FY 2008 Consolidated Appropriations Act (P.L. 110-161):

> *"The Administrator of the National Aeronautics and Space Administration shall prepare a strategy for minimizing job losses when the National Aeronautics and Space Administration transitions from the Space Shuttle to a successor human-rated space transport vehicle. This strategy shall include: (1) specific initiatives that the National Aeronautics and Space Administration has undertaken, or plans to undertake, to maximize the utilization of existing civil servant and contractor workforces at each of the affected Centers; (2) efforts to equitably distribute tasks and workload between the Centers to mitigate the brunt of job losses being borne by only certain Centers; (3) new workload, tasks, initiatives, and missions being secured for the affected Centers; and (4) overall projections of future civil servant and contractor workforce levels at the affected Centers. The Administrator shall transmit this strategy to Congress not later than 90 days after the date of enactment of this Act. The Administrator shall update and transmit to Congress this strategy not less than every six months thereafter until the successor human-rated space transport vehicle is fully operational."*

This *Third Edition* follows the release of the President's detailed FY 2010 budget submit and establishment of the Review of U.S. Human Space Flight Plans Committee. These recent events have reaffirmed the Administration's commitment to the broad goals laid out in current U.S. space exploration policy. Therefore, NASA's focus in the near-term remains unchanged – to safely and successfully fly out the remaining eight Space Shuttle missions, including a mission to deliver the Alpha Magnetic Spectrometer to the International Space Station (ISS), complete assembly of the ISS, and continue to bring the initial operating capability (IOC) for Orion and Ares I online as soon as possible after Shuttle retirement. This update focuses on particular activities that have occurred since the October 2008 edition was released; more information about NASA's overall Workforce Transition efforts may be found in that update, which can be accessed at:

http://www.nasa.gov/mission_pages/transition/home/second_strategy_report.html

While NASA is pressing ahead with its current plans, the Agency is also supporting the work of the Review Committee. The Review Committee is examining ongoing U.S. human space flight plans and programs, as well as alternatives, to ensure the Nation is pursuing the best trajectory for the future of human space flight – one that is safe, innovative, affordable, and sustainable. The Review Committee will present its results in August, in time to support an Administration decision on the way forward. In the meantime, NASA has postponed further lunar contract activities pending the review of the Review Committee. NASA is evaluating the workforce impact of this pause in lunar development work, including the effect any changes may have on the Agency's plans to transition a significant portion of the Space Shuttle workforce to lunar development activities. Meanwhile, NASA's near-term plans remain unchanged, and this is reflected in the updated FY 2009 and Nationwide-level FY 2010 workforce estimates in Tables 1 and 2, which are based upon current Space Shuttle and Constellation IOC development plans, including:

- Aligning work to enable an Ares I / Orion IOC no later than March 2015.

- Increasing Space Shuttle schedule margins by remanifesting two flights onto Space Shuttle *Atlantis* (OV-103), which previously was scheduled to be retired following the STS-125 servicing mission to the Hubble Space Telescope.

- Complying with direction provided by Congress in the NASA Authorization Act of 2008 (P.L. 110-422) to refrain from taking any actions prior to April 2009 that would preclude the option of flying the Space Shuttle beyond the planned 2010 retirement date.

- Significantly improved estimates of workforce requirements associated with Space Shuttle transition and retirement activities.

Table 1 provides updated workforce estimates for FY 2009 at both the Nationwide and the Center levels, and for FY 2010 at the Nationwide level. Both are consistent with the President's FY 2010 budget submit. The Center-level estimates in FY 2010 and all estimates for FY 2011 and out are carried over from the *Second Edition* of this report, dated October 2008, pending the results from the Review Committee. All other data in this report are NASA's best estimates as of May 2009 unless otherwise stated. The data will continue to mature over time and will be updated in future versions of this strategy.

Activities Since the October 2008 Update

- NASA and Space Florida hosted the Florida Workforce Leadership Summit in November 2008 at the Space Florida Conference Facility in Cape Canaveral. The Summit provided an opportunity for Federal, state, and local organizations to exchange information that could be beneficial in ensuring the retention of the highly skilled technical workforce required to carry out U.S. space exploration policy.

- NASA has established a Space Shuttle Transition Liaison Office within the NASA Office of Human Capital Management to provide a single point of contact for assisting local communities in adjusting to the end of the Space Shuttle Program.

- In March 2009, ATK extended a $257M contract to United Space Alliance (USA) for DDT&E work in support of the Ares I-X test flight and the Ares I first stage project; this continuation of the partnerships created for Space Shuttle helps to provide continuity between current and future operations.

- Phase III of NASA's Workforce Skills Mapping activity was near completion in June 2009; it will serve to further refine the civil service data that was originally developed for Phase I.

- At Johnson Space Center (JSC), the Integrated Mission Operations Contract (IMOC) and Facilities Operations and Development Contract (FDOC) were awarded in October 2008 and November 2008, respectively. Both will provide continuity of services to the Mission Operations Directorate, and thereby provide opportunities for the workforce after Shuttle retirement.

- NASA has established a Space Transportation Planning Office at Kennedy Space Center (KSC) to begin defining ground processing concepts for Ares I and Orion. A draft RFP for Exploration Ground Launch Services (EGLS) was released on May 20, 2009.

- In May 2009, NASA awarded the Mission Support and Facilities Operations Contract at the Michoud Assembly Facility (MAF) to Jacobs Technology, the first step in converting MAF into a multi-use facility capable of supporting multiple Constellation projects and their contractors.

- Space Shuttle contractors continue to reduce workforce as production, support, and operations milestones associated with the last flights are completed. Most of the drawdown activity is taking

place through normal workforce attrition, primarily by not backfilling positions that become available through retirements, reassignments, or other kinds of voluntary separations. When plans call for workforce reductions in excess of normal attrition rates by a sufficient margin[1], Federal law requires that contractors issue Worker Adjustment and Retraining Notification (WARN) Act notices to employees 60-days prior to any potential involuntary separation activities. During that 60-day period, contractors continue to monitor their workforce attrition trends and will, if necessary, adjust their final termination notices accordingly. WARN Act notices may also be issued in cases where employees are "rebadged" from an incumbent to a new contractor.

2.0 Workforce Projections

Background: NASA's projections for Center civil servant and contractor workforce levels are based on data from the Space Shuttle-to-Constellation Workforce Mapping activity and updates to civil servant full-time equivalent (FTE) and contractor WYE requirements from the Agency budget planning process. FTE and WYE are standard human capital measures, and are calculated based on the total number of hours that civil servants or contractors are charging directly to a project or program. FTE and WYE numbers are not headcounts, and should not be read as a count of the number of individual employees working for a project or program. For example, a civil servant may split time between two programs (see Figure 5: Transition of Civil Service Workforce), in which case the two programs would each count the percentage of that employee's time as part of their total FTE count.

NASA continues to mature its understanding of the FTE and WYE breakdown by programs and Centers, and will update these data accordingly as those estimates are refined.

Specific Workforce Information by Center/Location

Note on contractor workforce estimate numbers: In order to project probable contractor workforce levels in the future, NASA gathers information from contractors on their current work and estimates allocation of future budget reserves not yet assigned to any contract. These can include NASA estimates of future budget reserves according to pro-rata distributions or technical risk assessments, as well as estimates of the percentage of funds used to design and develop new and unique products versus raw materials or purchased services. Contractor workforce projections for these years, therefore, may contain data which are the sum of: (a) defined, approved work on contract; (b) the government's estimate of work not yet awarded or negotiated (i.e., procurement-sensitive information); (c) an informed estimate for budget reserves allocated to mitigate not-yet-identified future technical problems; and, (d) potential work not yet assigned by the government but under internal consideration. The details of these estimates cannot be made public, as potential bidders could use that information to determine the government's "should cost" estimate, or existing contractors could use that information to propose work up to that level. Additionally, many of the specific contractual details are still being refined as NASA continues to develop the appropriate acquisition strategies to meet its mission objectives at best value to the Nation.

Pursuant to P.L.110-161, Table 1 provides specific annual civil servant and contractor workforce projections for the four human spaceflight Centers (as well as MAF) that are most affected by the Shuttle-

[1] The thresholds for WARN Act notification are when either, a) a layoff may affect 500 or more employees, or b) a layoff may affect between 50 and 499 employees if they make up at least 33 percent of the employer's active workforce. For more information on WARN Act notification thresholds, see the U.S. Department of Labor website at www.doleta.gov/layoff/warn.cfm

to-Constellation transition, including a low and a high range based on the variability in data inputs discussed above. Table 2 provides similar data for the other NASA Centers.

2.1: Human Space Flight Center Workforce Trends and Caveats

Table 1: Human Spaceflight Center Workforce Trends (Shuttle and Constellation Only), FY2008-2013 (Estimates)

* Center-level estimates for FY 2010 (outlined in red) are carried over from the October 2008 report
** All estimates for FY 2011 through FY 2013 (outlined in red) are carried over from the October 2008 report

	ESTIMATES								
	FY09	FY10 *	Change: FY09-10	FY11 **	Change: FY10-11	FY12 **	Change: FY11-12	FY13 **	Change: FY12-13
Nationwide									
Shuttle + Constellation FTE	4,600	4,200	-400	4,100	-100	4,200	100	4,300	100
Shuttle + Constellation WYE (low)	20,500	20,000	-500	13,600	-6,400	14,300	700	14,800	500
Shuttle + Constellation WYE (high)	21,200	21,500	300	14,900	-6,600	16,200	1,300	17,000	800
Kennedy Space Center									
Shuttle + Constellation FTE	1,000	1,000	-	1,000	0	1,000	0	1,000	0
Shuttle + Constellation WYE	7,400	6,700	-	2,800	-3,900	3,300	500	3,800	500
Johnson Space Center									
Shuttle + Constellation FTE	1,400	1,400	-	1,200	-200	1,200	0	1,300	100
Shuttle + Constellation WYE (low)	6,500	6,000	-	3,700	-2,300	3,800	100	3,500	-300
Shuttle + Constellation WYE (high)	7,400	6,600	-	5,500	-1,100	5,700	200	5,800	100
Marshall Space Flight Center									
Shuttle + Constellation FTE	1,300	1,200	-	1,200	0	1,300	100	1,300	0
Shuttle + Constellation WYE (low)	4,500	2,900	-	2,800	-100	3,000	200	3,100	100
Shuttle + Constellation WYE (high)	4,500	3,500	-	4,400	900	5,100	700	5,500	400
Stennis Space Center									
Shuttle + Constellation FTE	50	100	-	100	0	100	0	100	0
Shuttle + Constellation WYE	300	300	-	200	-100	200	0	200	0
Michoud Assembly Facility									
Shuttle + Constellation WYE	1,800	1,100	-	1,100	0	1,100	0	1,100	0

Key Points

- This table will be updated with the results of the "Review of United States Human Space Flight Plans", scheduled for completion in August 2009, and will be updated in the next revision to this report.

Basis of Estimates

- Data is rounded to the nearest hundred, with the exception of SSC, which is rounded to the nearest ten.
- FTE and WYE estimates in FY 2009 are NASA's best estimates per current plans as of May 2009. Nationwide estimates in FY 2010 are estimates based on the President's FY 2010 budget submit. Since the FY 2009 Center-level estimates have been updated, but the FY 2010 Center-level estimates have not, the FY 2009 to FY 2010 change column has been left blank.
- Center-level estimates in FY 2010, and all estimates in FY 2011 through FY 2013, are the same as reported in the October 2008 report.
- Estimates do not include impacts associated with the American Recovery and Reinvestment Plan.
- The projections for Nationwide WYEs in FY 2009 and FY 2010 are based on NASA's cost plans for those years, including Constellation program unallocated reserves that would be available to support work at the Centers when needed. These projections include work already under contract, as well as estimates of future workforce utilization.
- Estimates do not include Orbiter "public display" safing and display preparation activities after 2010. Current estimates for display and preparation are $42M per Orbiter, and are assumed to be reimbursed to NASA by Orbiter recipient institutions. All safing and preparation work will be done by NASA, mostly at KSC and WSTF.
- Contractor workforce participating in Commercial Orbital Transportation Services (COTS) and follow-on Commercial Resupply Service (CRS) work are not included.
- Marshall Space Flight Center (MSFC) WYE estimates include off-site labor at ATK (Utah) and Pratt & Whitney Rocketdyne (Florida) for Constellation that is managed by MSFC.

- KSC estimates include labor associated with Constellation program facilities construction projects. KSC estimates do not include Constellation operations planning activities.
- FTE estimates do not include students and co-ops.

2.2: Other Center Workforce Trends and Caveats

Table 2: Other Center Workforce Trends (Shuttle and Constellation Only), FY 2008-2013 (Estimates)

* Center-level estimates for FY 2010 (outlined in red) are carried over from the October 2008 report

Category	FY09*	FY10*	Change: FY09-10	FY11*	Change: FY10-11	FY12*	Change: FY11-12	FY13*	Change: FY12-13	Change: FY09-13
Ames Research Center										
Shuttle + Constellation FTEs	130	100	-30	110	10	110	0	110	0	-20
Shuttle + Constellation WYEs	40	40	0	40	0	40	0	40	0	0
Dryden Flight Research Center										
Shuttle + Constellation FTEs	70	50	-20	20	-30	20	0	10	-10	-60
Shuttle + Constellation WYEs	80	60	-20	10	-50	10	0	0	-10	-80
Glenn Research Center										
Shuttle + Constellation FTEs	240	210	-30	230	20	250	20	250	0	10
Shuttle + Constellation WYEs	70	60	-10	70	10	50	-20	50	0	-20
Goddard Space Flight Center										
Shuttle + Constellation FTEs	40	50	10	50	0	60	10	70	10	30
Shuttle + Constellation WYEs	10	10	0	20	10	40	20	60	20	50
Jet Propulsion Laboratory										
Shuttle + Constellation FTEs	0	0	0	0	0	0	0	0	0	0
Shuttle + Constellation WYEs	30	40	10	30	-10	50	20	60	10	30
Langley Research Center										
Shuttle + Constellation FTEs	250	220	-30	250	30	260	10	270	10	20
Shuttle + Constellation WYEs	70	40	-30	50	10	40	-10	50	10	-20

Key Points

- The science and research Centers continue to play an important role in Constellation DDT&E.
- This table will be updated with the results of the "Review of United States Human Space Flight Plans," scheduled for completion in August 2009, and will be updated in the next update to this report.

Basis of Estimates

- Estimates through FY 2013 are the same as reported in the October 2008 report.
- Data is rounded to the nearest ten.
- The projections for nationwide WYEs are based on NASA's cost plans for FY 2009-2014. Constellation program unallocated reserves are held at the Nationwide level on Table 1, and would be available to support work at the Centers when needed. These projections include work already under contract, as well as parametric estimates of future workforce utilization.
- FTE estimates do not include students and co-ops.

All of NASA's Centers – even those with a particular focus on human spaceflight development and operations (i.e., JSC, KSC, MSFC, and SSC) – also support programmatic and institutional activity beyond the Space Shuttle and Constellation programs. Table 3 lists the total number of FTEs and on-site and near-site WYEs for each of the NASA Centers as of the end of FY 2008, rounded to the nearest hundred.

Table 3: Total Center FTEs and WYEs (on- and near-site), FY 2008

Center	FTEs	WYEs
Ames Research Center	1,300	1,300
Dryden Flight Research Center	600	600
Glenn Research Center	1,600	1,300
Goddard Space Flight Center	3,100	5,700
Jet Propulsion Laboratory	-	5,000
Johnson Space Center	3,400	13,900
Kennedy Space Center	2,200	9,900
Langley Research Center	2,000	1,700
Marshall Space Flight Center	2,700	4,200
Stennis Space Center	300	800

It should be noted that the Center estimates in Tables 1 and 2 include all work managed by that Center, including work performed at off-site contractor facilities (for example, MSFC WYE figures in Table 1 include work performed at ATK in Utah and Pratt & Whitney Rocketdyne in Florida). The data in Table 3, on the other hand, counts only contractor work performed on-site or near to the Center gates.

Taking KSC as an example, the contractor equivalents provided a broad range of support services, including NASA program work, Center operations, construction, and activities not funded by NASA (e.g., Visitors Center operations and activities funded by other government agencies, such as the Department of Defense, General Services Administration, or National Park Service). In comparison, the total number of Space Shuttle and Constellation program equivalents at KSC in FY 2009 in Table 1 was approximately 1,000 civil servants and approximately 6,500 contractor equivalents. Similar comparisons can be made for the other sites shown in Table 1, but become more complex for sites such as JSC or MSFC, which manage a substantial amount of work by contractors located in states other than Texas or Alabama.

Focusing on the Shuttle and Constellation elements nationwide, NASA plans to spend roughly the same amount of money on the purchase of products and services from its contractors as before. Presently, the budget and workforce distributions are well known for the existing Shuttle program, while the Constellation aspects are continually being refined as previously discussed. Requirements maturation, budget allocations, future contract awards, and reserve expenditures on currently unknown future cost, schedule, technical, and safety risks will better define the precise workforce, skill, and location-based needs of the projects.

As the Space Shuttle Program begins to phase out, the Shuttle prime contractors project that contractor workforce will begin to be drawn down. Some of these drawdowns will be offset by new work coming online in the Constellation Program. During the same period, Constellation work requirements will increase. Contractor workforce synergy with Shuttle and Constellation work definition has served to lessen overall contractor workforce reductions.

As of the date of this report, not all of the Constellation work content that is expected to follow Orion/Ares I initial and full operational capability has been included in the Space Shuttle Workforce Mapping effort. It is anticipated that future content will be updated in future updates to this plan.

3.0 The Road Ahead

In the summer of 2009, the Human Space Flight committee is reviewing ongoing Exploration activities as well as alternatives to ensure the Nation is pursuing the best technical solution for future human spaceflight – one that is safe, innovative, affordable, and sustainable. The review will develop suitable options for U.S. human spaceflight activities beyond retirement of the Space Shuttle, leading to an Adminstration decision and plans for the future of human spaceflight. These plans will be presented to Congress regarding the core transportation elements and related aspects of a U.S.-led human spaceflight architecture that would support both crew transportation and rescue missions to the International Space Station and missions to the Moon and other destinations beyond low-Earth orbit. The detailed FY 2010 and outyear funding levels for individual Exploration activities presented in this document are placeholders. Following the conclusion of the review, the Administration will provide an updated budget request for Exploration that reflects the outcome of the review. The next update to this *Strategy* will reflect the results of that review from a workforce perspective.

The Agency will continue to keep the Congress informed of progress on Transition activities, and will provide semi-annual updates to this report.